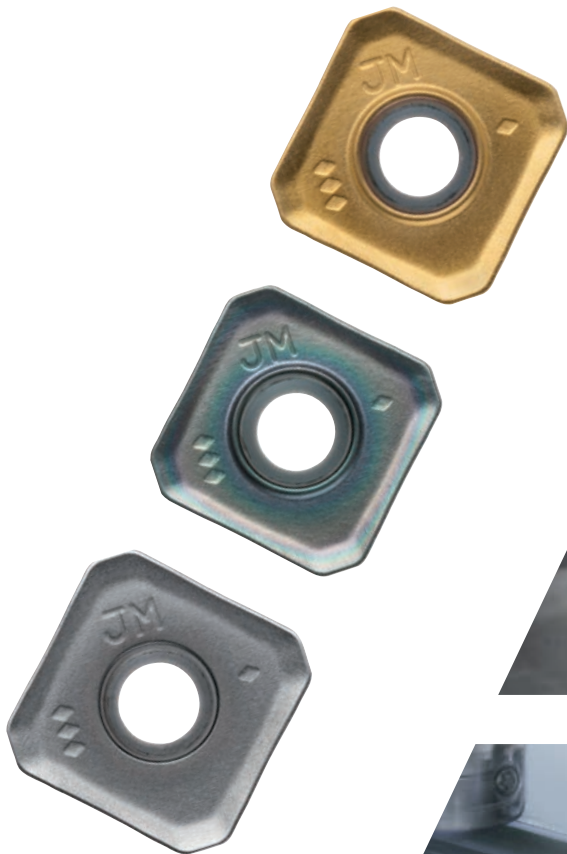


New PVD Coated Grades

MP6100/MP7100/MP9100

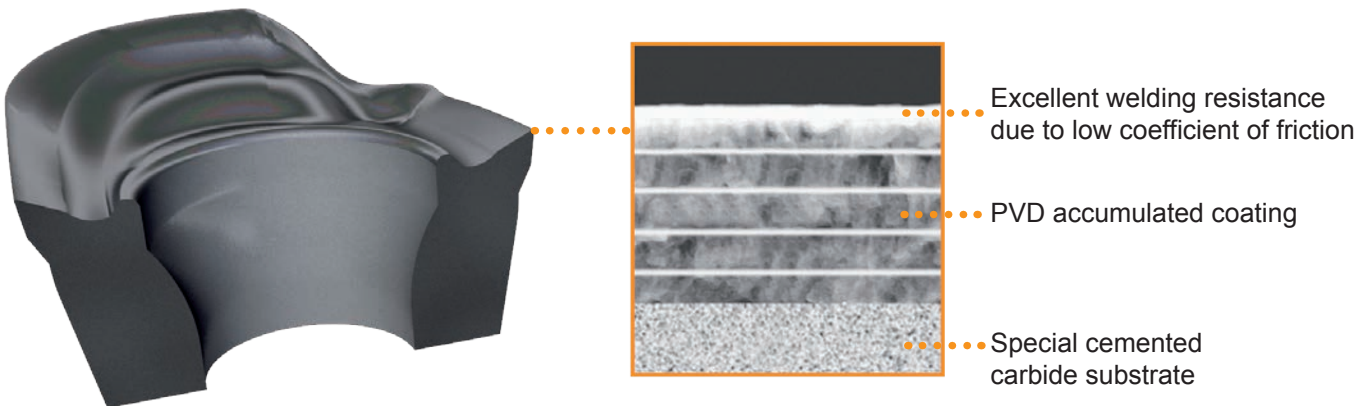
Specialised grades for specific materials.



New PVD Coated Grades

MP6100/MP7100/MP9100

TOUGH-Σ Technology



The new MIRACLE SIGMA PVD coatings have excellent coefficient of friction and toughness properties together with exceptional resistance to wear and chip welding. Multi-layering of the coating prevents any cracks penetrating through to the substrate.

New Milling Grades for high productivity.

New PVD-coated high performance grades MP6100, MP7100 and MP9100 powered by MIRACLE SIGMA. Available for milling cutter types ASX, APX, AJX, AXD, VFX and SRF.

ISO	STEEL
P10	MP6120
P20	
P30	
P40	
	MP6130

MP6100: PVD multi-layer coated carbide milling grades for ISO-P material group.

High wear and thermal cracking resistance allows higher cutting speeds compared to conventional PVD coated carbide grades.

ISO	STAINLESS STEEL
M10	MP7130
M20	
M30	
M40	
	MP7140

MP7100: PVD multi-layer coated carbide milling grades for stainless steels.

With high resistance to thermal cracking and a smooth surface to prevent chip welding.

ISO	HRSA AND TITANIUM
S10	MP9120
S20	
S30	
S40	
	MP9130

MP9100: PVD multi-layer coated carbide milling grades for heat resistant super alloys.

With high resistance to thermal cracking and a smooth surface to prevent chip welding.

ASX400



INSERTS

Application	Shape	Order Number	Class	Honing	Coated										Cermet	Carbide	Dimensions (mm)				Geometry		
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT			NX4545	HTi10	D1	S1		F1	Re
Finish— Light Cutting	JL	SOET12T308PEER-JL	E	E	●	●	●	●	●	●	●	●	●	●	●	●			12.7	3.97	1.4	0.8	
Light— Semi-Heavy Cutting	JM	SOMT12T308PEER-JM	M	E	●	●	●	●	●	●	●	●	●	●	●	●			12.7	3.97	1.4	0.8	
Medium— Heavy Cutting	JH	SOMT12T308PEER-JH	M	E	●	●	●	●	●	●	●	●	●	●	●	●			12.7	3.97	1.4	0.8	
Heavy Interrupted Cutting	FT	SOMT12T320PEER-FT	M	E	●	●					●	●	●						12.7	3.97	0.5	2.0	
For Aluminium Alloy	JP	SOGT12T308PEFR-JP	G	F												●		12.7	3.97	1.4	0.8		

Cutting Conditions (Guide) :
 ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting

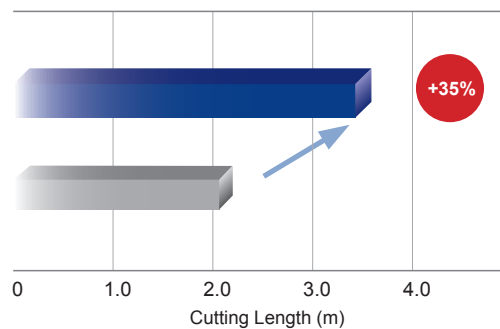
Honing :
 E : Round
 F : Sharp
 T : Chamfer
 S : Chamfer + Hone

Application example

MP9120



Conventional



MP9120

Conventional

Cutting Conditions
 Work : Ti6Al4V
 Cutter : ASX400-063A04R
 Insert : SOMT12T308PEER-JM
 Cutting Speed : 60 m/min
 Feed per Tooth : 0.1 mm/tooth
 Depth of Cut : 40 mm, ap 8.0 mm
 Coolant : Emulsion

ASX445

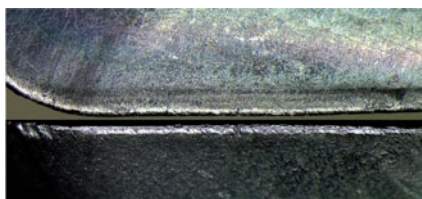


INSERTS

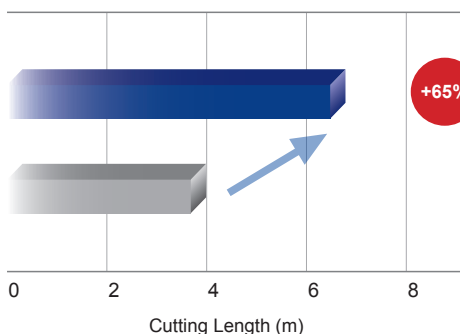
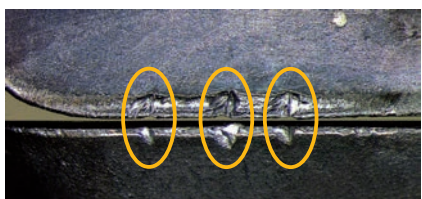
Work Material		P	Steel															Cutting Conditions (Guide) :			
		M	Stainless Steel															● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting			
Work Material		K	Cast Iron															Honing :			
		N	Non-ferrous Metal															E : Round			
Work Material		S	Heat-resistant Alloy, Titanium Alloy															F : Sharp			
		H	Hardened Steel															T : Chamfer			
																S : Chamfer + Hone					
Application	Shape	Order Number	Class	Honing	Coated										Cemet	Carbide	Dimensions (mm)				Geometry
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT			NX4545	D1	S1	F1	
Finish-Light Cutting	JL	SEET13T3AGEN-JL	E	E	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
	JM	SEMT13T3AGSN-JM	M	S	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
Light-Semi-Heavy Cutting	JH	SEMT13T3AGSN-JH	M	S	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
	FT	SEMT13T3AGSN-FT	M	S	●												13.4	3.97	1.9	1.5	
Medium-Heavy Cutting	JH	SEMT13T3AGSN-JH	M	S	●	●	●	●	●	●	●	●	●	●	●	●	13.4	3.97	1.9	1.5	
Roughing For Cast Iron	FT	SEMT13T3AGSN-FT	M	S	●												13.4	3.97	1.9	1.5	
For Aluminum Alloy	JP	SEGT13T3AGFN-JP	G	F												●	13.4	3.97	2.2	-	

Application example

MP6120



Conventional



Cutting Conditions
 Work : SCM440
 Cutter : ASX445-125B08R
 Insert : SEMT13TAGSN-JM
 Cutting Speed : 300 m/min
 Feed per Tooth : 0.2 mm/tooth
 Depth of Cut : ae 100 mm, ap 2.0 mm
 Coolant : Emulsion



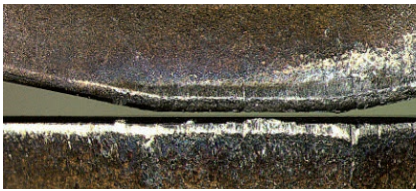
INSERTS

Work Material	P	Steel	●	●	●	●	●	●	●	Cutting Conditions : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting					
	M	Stainless Steel	●	●	●	●	●	●	●						
Work Material	K	Cast Iron	●	●	●	●	●	●	●						
	S	Heat-resistant Alloy, Titanium Alloy	●	●	●	●	●	●	●						
	H	Hardened Materials	●	●	●	●	●	●	●						
Shape	Order Number	Class	Coated						Dimensions (inch)					Geometry	
			FH7020	MP6125	MP6130	MP7130	MP7140	VP15TF	VP30RT	B ₃ °	D ₁	S ₁	F ₁		Re
	JOMW06T215ZZSR-FT	M	●	●	●	●	●	●	●	13°	6.35	2.78	1.2	1.5	
	080320ZZSR-FT	M	●	●	●	●	●	●	●	13°	8	3.18	1.4	2	
	JDMW09T320ZDSR-FT	M	●	●	●	●	●	●	●	15°	9.525	3.97	1.8	2	
	120420ZDSR-FT	M	●	●	●	●	●	●	●	15°	12	4.76	2.5	2	
	140520ZDSR-FT	M	●	●	●	●	●	●	●	15°	14	5.56	2.8	2	
	JDMT120420ZDSR-ST	M	●	●	●	●	●	●	●	15°	12	4.76	2.5	2	
	140520ZDSR-ST	M	●	●	●	●	●	●	●	15°	14	5.56	2.8	2	
	JOMT06T215ZZSR-JM	M	●	●	●	●	●	●	●	13°	6.35	2.78	1.2	1.5	
	080320ZZSR-JM	M	●	●	●	●	●	●	●	13°	8	3.18	1.4	2	
	JDMT09T320ZDSR-JM	M	●	●	●	●	●	●	●	15°	9.525	3.97	1.8	2	
	120420ZDSR-JM	M	●	●	●	●	●	●	●	15°	12	4.76	2.5	2	
	140520ZDSR-JM	M	●	●	●	●	●	●	●	15°	14	5.56	2.8	2	

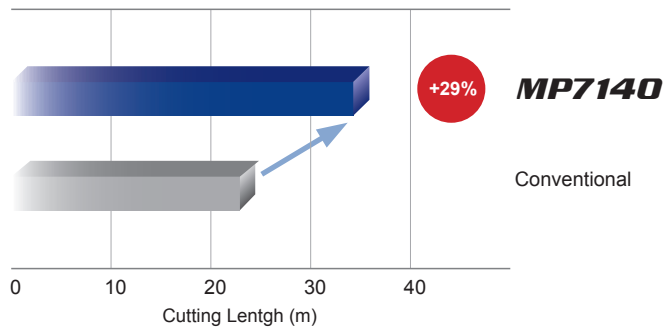
(Note) When using ST chip breaker, please check the height setting as it differs from other chip breakers.

Application example

MP7140



Conventional


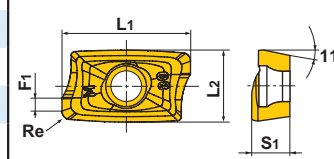

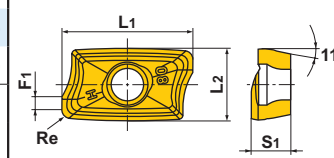

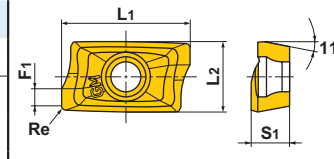


Cutting Conditions
 Work : SUS304
 Cutter : AJX14R-063A04R
 Insert : JDMT140520ZDSR-JM
 Cutting Speed : 140 m/min
 Feed per Tooth : 1.8 mm/tooth
 Depth of Cut : 40 mm, ap 1.0 mm
 Coolant : Emulsion

APX3000



INSERTS

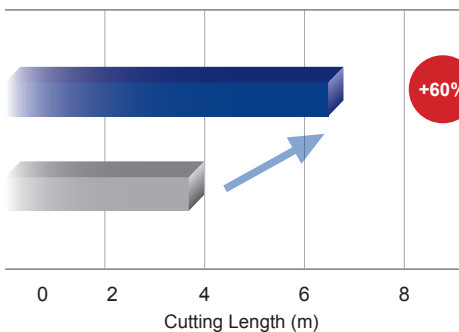
Work Material	P	Steel	●	●	●	●	●	●	●	●	●	●	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting					
	M	Stainless Steel	●	●	●	●	●	●	●	●	●	●	●	●						
Work Material	K	Cast Iron	●	●	●	●	●	●	●	●	●	●	●	●	Honing : E : Round F : Sharp T : Chamfer					
	N	Non-ferrous Metal	●	●	●	●	●	●	●	●	●	●	●	●						
	S	Heat-resistant Alloy, Titanium Alloy	●	●	●	●	●	●	●	●	●	●	●	●						
	H	Hardened Steel	●	●	●	●	●	●	●	●	●	●	●	●						
Shape	Order Number	Class	Honing	Coated								Carbide	Dimensions (mm)					Geometry		
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15	L1	L2	S1	F1	Re			
M Breaker 	AOMT123602PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.8	0.2	
	123604PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.6	0.4	
	123608PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.2	0.8	
	123610PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.0	1.0	
	123612PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.8	1.2	
	123616PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.4	1.6	
	123620PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.4	2.0	
	123624PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.4	2.4	
	123630PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.4	3.0	
123632PEER-M	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.4	3.2		
Strong Cutting Edge H Breaker 	AOMT123604PEER-H	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.6	0.4	
	123608PEER-H	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.2	0.8	
	123616PEER-H	M	E	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	0.4	1.6	
For Aluminium GM Breaker 	AOGT123602PEFR-GM	G	F	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.8	0.2	
	123604PEFR-GM	G	F	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.6	0.4	
	123608PEFR-GM	G	F	●	●	●	●	●	●	●	●	●	●	●	12	6.6	3.6	1.2	0.8	

Application example

MP9130



Conventional



Conventional

Cutting Conditions
 Work : Ti6Al4V
 Cutter : APX3000R324SA32SA
 Insert : AOMT123608PEER-M
 Cutting Speed : 60 m/min
 Feed per Tooth : 0.1 mm/tooth
 Depth of Cut : ae 8.0 mm, ap 8.0 mm
 Wet Cutting

APX4000



INSERTS

Work Material	P	Steel	●	●	●	●	●	●	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting						
	M	Stainless Steel	●	●	●	●	●	●	●	●							
Work Material	K	Cast Iron	●	●	●	●	●	●	●	●	Honing : E : Round F : Sharp T : Chamfer						
	N	Non-ferrous Metal	●	●	●	●	●	●	●	●							
	S	Heat-resistant Alloy, Titanium Alloy	●	●	●	●	●	●	●	●							
	H	Hardened Steel	●	●	●	●	●	●	●	●							
Shape	Order Number	Class	Honing	Coated						Dimensions (mm)					Geometry		
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	L1	L2	S1		F1	Re
General M Breaker	AOMT184804PEER-M	M	E	●	●	●	●	●	●	●	●	18	9	4.8	1.8	0.4	
	184808PEER-M	M	E	●	●	●	●	●	●	●	●	18	9	4.8	1.4	0.8	
	184810PEER-M	M	E	●	●	●	●	●	●	●	●	18	9	4.8	1.0	1.0	
	184812PEER-M	M	E	●	●	●	●	●	●	●	●	18	9	4.8	0.8	1.2	
	184816PEER-M	M	E	●	●	●	●	●	●	●	●	18	9	4.8	0.4	1.6	
184820PEER-M	M	E	●	●	●	●	●	●	●	●	●	18	9	4.8	0.4	2.0	
Strong Cutting Edge Type H Breaker	AOMT184804PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	1.8	0.4	
	184808PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	1.4	0.8	
	184816PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	0.4	1.6	
	184832PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	0.4	3.2	
	184840PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	0.4	4.0	
	184850PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	—	5.0	
184864PEER-H	M	E	●	●	●	●	●	●	●	●	18	9	4.8	—	6.35		

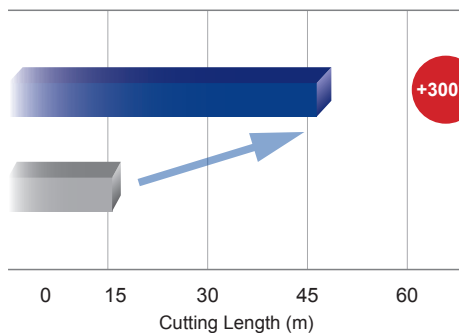


Application example

MP6120



Conventional



Cutting Conditions
 Work : C45
 Cutter : APX4000R08007CA
 Insert : AOMT184808PEER-M
 Cutting Speed : 165 m/min
 Feed per Tooth : 0.15 mm/tooth
 Depth of Cut : ae 50.0 mm, ap 3.0 mm
 Coolant : Emulsion

ASX400



RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Finish—Light Cutting		Light—Semi-Heavy Cutting		Medium—Heavy Cutting		
				Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	
P Mild Steel	≤180HB	F7030	280 (210—350)	0.18 (0.08—0.28)	JL	0.2 (0.1—0.3)	JM	0.25 (0.1—0.35)	JH	
		MP6120	250 (200—300)	—	—	0.2 (0.1—0.3)	JM	—	—	
		VP15TF	250 (200—300)	0.18 (0.08—0.28)	JL	0.2 (0.1—0.3)	JM	0.25 (0.1—0.35)	JH FT	
		VP30RT	230 (180—280)	0.18 (0.08—0.28)	JL	0.2 (0.1—0.3)	JM	0.25 (0.1—0.35)	JH	
		NX4545	180 (130—230)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	—	—	
	Carbon Steel Alloy Steel	180—280HB	F7030	250 (200—300)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	0.2 (0.1—0.3)	JH
			MP6120	220 (170—270)	—	—	0.18 (0.1—0.28)	JM	—	—
			VP15TF	220 (170—270)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	0.2 (0.1—0.3)	JH FT
			VP30RT	200 (150—250)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	0.2 (0.1—0.3)	JH
			NX4545	150 (120—180)	0.13 (0.06—0.2)	JL	0.15 (0.1—0.25)	JM	—	—
	280—350HB	F7030	180 (130—230)	0.13 (0.06—0.2)	JL	0.15 (0.1—0.25)	JM	0.18 (0.1—0.28)	JH	
		MP6120	140 (100—180)	—	—	0.15 (0.1—0.25)	JM	—	—	
		VP15TF	140 (100—180)	0.13 (0.06—0.2)	JL	0.15 (0.1—0.25)	JM	0.18 (0.1—0.28)	JH FT	
		VP30RT	120 (80—160)	0.13 (0.06—0.2)	JL	0.15 (0.1—0.25)	JM	0.18 (0.1—0.28)	JH	
		NX4545	100 (80—120)	0.1 (0.05—0.15)	JL	0.13 (0.1—0.2)	JM	—	—	
M Stainless Steel	≤270HB	VP15TF	220 (170—270)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	0.2 (0.1—0.3)	JH FT	
		VP30RT	200 (150—250)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	0.2 (0.1—0.3)	JH	
		NX4545	150 (120—180)	0.15 (0.07—0.23)	JL	0.18 (0.1—0.28)	JM	—	—	
K Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	200 (150—250)	—	—	0.2 (0.1—0.3)	JM	0.25 (0.1—0.35)	JH FT	
		VP15TF	180 (130—230)	0.18 (0.1—0.28)	JL	0.2 (0.1—0.3)	JM	0.25 (0.1—0.35)	JH FT	
N Aluminium Alloy	—	HTi10	300—	0.15 (0.1—0.2)	JP	0.2 (0.1—0.3)	JP	0.3 (0.2—0.4)	JP	
S Titanium Alloy	—	MP9120	50 (40—60)	—	—	0.15 (0.05—0.2)	JM	—	—	
		VP15TF	50 (40—60)	0.1 (0.05—0.2)	JL	0.15 (0.05—0.2)	JM	—	—	
	Heat Resistant Alloy	—	MP9120	40 (20—50)	—	—	0.15 (0.05—0.2)	JM	—	—
			VP15TF	40 (20—50)	0.1 (0.05—0.2)	JL	0.15 (0.05—0.2)	JM	—	—
H Hardened Steel	40—55HRC	VP15TF	80 (60—100)	0.08 (0.04—0.13)	JL	0.1 (0.05—0.15)	JM	0.12 (0.07—0.17)	JH FT	

● Revolution (min⁻¹)=(1000 x Cutting Speed) ÷ (3.14 x φD1) ● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

ASX445



RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Finish-Light Cutting		Light-Semi-Heavy Cutting		Medium-Heavy Cutting		
				Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	Feed per Tooth (mm/tooth)	Breaker	
P Mild Steel	≤180HB	F7030	280 (210-350)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		MP6120 VP15FT	250 (200-300)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		MP6130	240 (190-290)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		VP30RT	230 (180-280)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		NX4545	180 (130-230)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—	
	Carbon Steel Alloy Steel	180-280HB	F7030	250 (200-300)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH
			MP6120 VP15FT	220 (170-270)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH
			MP6130	200 (150-230)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH
			VP30RT	150 (120-180)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH
			NX4545	150 (120-180)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—
	280-350HB	F7030	180 (130-230)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		MP6120 VP15FT	140 (100-180)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		MP6130	120 (90-150)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		VP30RT	100 (80-160)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		NX4545	100 (80-160)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—	
M Stainless Steel	≤270HB	MP7130 VP15FT	220 (170-270)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		MP7140 VP30FT	200 (150-250)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
		NX4545	150 (120-180)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—	
K Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	200 (150-250)	—	—	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH FT	
		VP15TF	180 (130-250)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH	
	Tensile Strength ≥450MPa	MC5020	110 (80-150)	—	—	0.2 (0.1-0.3)	JM	0.3 (0.2-0.4)	JH FT	
N Aluminium Alloy	—	HTi10	650 (300-1000)	0.15 (0.1-0.2)	JP	0.2 (0.1-0.3)	JP	0.3 (0.2-0.4)	JP	
S Titanium Alloy	—	MP9120 VP15FT	50 (40-60)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—	
		MP9130	45 (30-55)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—	
	Heat Resistant Alloy (Inconel718 etc.)	—	MP9120 VP15FT	40 (20-50)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—
			MP9130	35 (15-45)	0.15 (0.1-0.2)	JL	0.2 (0.1-0.3)	JM	—	—
H Hardened Steel	40-55HRC	VP15TF	80 (60-100)	0.1 (0.05-0.15)	JL	0.15 (0.1-0.2)	JM	0.2 (0.1-0.3)	JH	

● Revolution (min⁻¹)=(1000 x Cutting Speed)÷(3.14 x φD₁)

● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution



RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	ø16 - 17			ø20 - 22			ø25 - 28		
				Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)
P Mild Steel	≤180HB	FH7020	170 (120-220)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
		MP6120	150 (100-200)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
		FH6130	130 (80-180)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
		VP30RT	110 (60-160)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
Carbon Steel Alloy Steel	180-280HB	FH7020	150 (100-200)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
		MP6120	130 (80-180)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
		FH6130	110 (60-160)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
		VP30RT	90 (40-140)	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
				180	0.8	0.6	210	0.8	0.8	230	0.8	1.0
				210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
Carbon Steel Alloy Steel	280-350HB	FH7020	130 (80-180)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
		MP6120	100 (50-150)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
		FH6130	80 (30-130)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
		VP30RT	60 (20-110)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
Alloy Tool Steel	≤350HB	FH7020	130 (80-180)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
		MP6120	100 (50-150)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
		FH6130	80 (30-120)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
		VP30RT	60 (20-90)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
Pre-hardened Steel	35-45HRC	MP6120	100 (70-130)	140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
				180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
				210	0.3	0.3	240	0.4	0.4	290	0.4	0.6
		FH6130	80 (50-110)	140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
				180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
				210	0.3	0.3	240	0.4	0.4	290	0.4	0.6
		VP30RT	80 (30-90)	140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
				180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
				210	0.3	0.3	240	0.4	0.4	290	0.4	0.6



RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	ø16 - 17			ø20 - 22			ø25 - 28		
				Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)
M Stainless Steel	≤200HB	MP7130	140 (100–180)	140	0.8	0.7	160	1.0	0.8	170	1.0	1.0
				180	0.6	0.5	210	0.8	0.6	230	0.8	0.8
				210	0.4	0.3	240	0.6	0.4	290	0.6	0.6
		MP7140	120 (80–160)	140	0.8	0.7	160	1.0	0.8	170	1.0	1.0
				180	0.6	0.5	210	0.8	0.6	230	0.8	0.8
				210	0.4	0.3	240	0.6	0.4	290	0.6	0.6
K Gray Cast Iron Ductile Cast Iron	≤200HB	FH7020	150 (100–200)	140	0.8	1.0	160	1.0	1.2	170	1.0	1.4
				180	0.6	0.8	210	0.8	1.0	230	0.8	1.2
				210	0.4	0.6	240	0.6	0.8	290	0.6	1.0
	≤450MPa	VP15TF	120 (80–160)	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
				180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
				210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
H Hardened Steel	40–55HRC	VP15TF	70 (50–90)	140	0.5	0.5	160	0.5	0.6	170	0.5	0.8
				180	0.4	0.3	210	0.4	0.4	230	0.4	0.6
				210	0.3	0.2	240	0.3	0.2	290	0.3	0.4

	ø30 - 35			ø40 (ø32 Shank)			ø40 (ø42 Shank)			ø50/ø63 (Shank type)			ø50/ø63 (Arbor type)			ø80 - 160 (Arbor type)		
	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)	Overhang (mm)	Axial Depth of Cut (mm)	Feed per Tooth (mm/tooth)
	180	1.2	1.2	180	1.2	1.2	180	1.2	1.3	180	1.4	1.3	150	1.5	1.3	170	1.5	1.3
	230	1.0	1.0	240	1.0	1.0	240	1.0	1.1	240	1.2	1.1	250	1.3	1.1	300	1.3	1.1
	290	0.8	0.8	300	0.8	0.8	300	0.8	0.9	—	—	—	350	1.1	0.9	450	1.0	0.8
	180	1.2	1.2	180	1.2	1.2	180	1.2	1.3	180	1.4	1.3	150	1.5	1.3	170	1.5	1.3
	230	1.0	1.0	240	1.0	1.0	240	1.0	1.1	240	1.2	1.1	250	1.3	1.1	300	1.3	1.1
	290	0.8	0.8	300	0.8	0.8	300	0.8	0.9	—	—	—	350	1.1	0.9	450	1.0	0.8
	180	1.2	1.6	180	1.2	1.6	180	1.2	1.7	180	1.4	1.7	150	1.5	1.7	170	1.5	1.7
	230	1.0	1.4	240	1.0	1.4	240	1.0	1.5	240	1.2	1.5	250	1.3	1.5	300	1.3	1.5
	290	0.8	1.2	300	0.8	1.2	300	0.8	1.3	—	—	—	350	1.1	1.3	450	1.0	1.2
	180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
	230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
	290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	—	—	—	350	0.9	1.1	450	0.8	1.0
	180	0.6	1.0	180	0.6	1.0	180	0.6	1.1	180	0.8	1.1	150	0.9	1.1	170	0.9	1.1
	230	0.5	0.8	240	0.5	0.8	240	0.5	0.9	240	0.6	0.9	250	0.7	0.9	300	0.7	0.9
	290	0.4	0.6	300	0.4	0.6	300	0.4	0.7	—	—	—						

APX3000



RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT / FEED PER TOOTH

Work Material	Hardness	Cutting Width ae (mm)	Cutter Diameter (mm)					
			ø12-ø16		ø18-ø25		ø28-ø100	
			Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)
P Mild Steel Carbon Steel Alloy Steel	≤180HB 180-350HB	≤0.25D1	<4	0.15	<5	0.25	<5	0.20
			4-7	0.10	5-7	0.20	5-7	0.15
					7-8.5	0.15	7-8.5	0.10
					8.5-10	0.10	8.5-10	0.07
		0.25-0.5D1	<2	0.15	<3	0.25	<3	0.20
			2-5	0.10	3-5.5	0.20	3-5.5	0.15
					5.5-8	0.15	5.5-8	0.10
					8-10	0.10	8-10	0.07
		0.5-0.75D1	<4	0.10	<4	0.15	<3	0.10
					4-10	0.10	3-7	0.07
		D1 (Slot)	<3	0.10	<4	0.10	<3	0.10
					4-7	0.07	3-5	0.07
M Stainless Steel	≤270HB	≤0.25D1	<4	0.15	<5	0.20	<5	0.20
			4-7	0.10	5-7	0.15	5-7	0.15
					7-8.5	0.10	7-8.5	0.10
					8.5-10	0.07	8.5-10	0.07
		0.25-0.5D1	<2	0.15	<3	0.20	<3	0.20
			2-5	0.10	3-5.5	0.15	3-5.5	0.15
					5.5-8	0.10	5.5-8	0.10
					8-10	0.07	8-10	0.07
		0.5-0.75D1	<4	0.10	<4	0.10	<3	0.10
					4-10	0.07	3-7	0.07
		D1 (Slot)	<3	0.10	<4	0.10	<3	0.10
					4-7	0.07	3-5	0.07
K Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25D1	<4	0.15	<5	0.25	<5	0.20
			4-7	0.10	5-7	0.20	5-7	0.15
					7-8.5	0.15	7-8.5	0.10
					8.5-10	0.10	8.5-10	0.07
		0.25-0.5D1	<2	0.15	<3	0.25	<3	0.20
			2-5	0.10	3-5.5	0.20	3-5.5	0.15
					5.5-8	0.15	5.5-8	0.10
					8-10	0.10	8-10	0.07
		0.5-0.75D1	<4	0.10	<4	0.15	<3	0.10
					4-10	0.10	3-7	0.07
		D1 (Slot)	<3	0.10	<4	0.10	<3	0.10
					4-7	0.07	3-5	0.07
Ductile, Cast Iron	Tensile Strength ≤800MPa	≤0.25D1	<4	0.10	<5	0.20	<5	0.20
			4-7	0.07	5-7	0.15	5-7	0.15
					7-8.5	0.10	7-8.5	0.10
					8.5-10	0.07	8.5-10	0.07
		0.25-0.5D1	<2	0.10	<3	0.20	<3	0.20
			2-5	0.07	3-5.5	0.15	3-5.5	0.15
					5.5-8	0.10	5.5-8	0.10
					8-10	0.07	8-10	0.07
		0.5-0.75D1	<4	0.07	<4	0.10	<3	0.10
					4-10	0.07	3-7	0.07
		D1 (Slot)	<3	0.07	<4	0.10	<3	0.10
						0.07	3-5	0.07

Work Material	Hardness	Cutting Width ae (mm)	Cutter Diameter (mm)					
			ø12-ø16		ø18-ø25		ø28-ø100	
			Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)
N Aluminium Alloy	—	≤ 0.25D ₁	<4	0.15	<4	0.25	<4	0.20
			4-7	0.10	4-7	0.15	4-7	0.10
		0.25-0.5D ₁	<4	0.15	<4	0.20	<4	0.20
			4-7	0.10	4-7	0.10	4-7	0.10
S Titanium Alloy	≤350HB	≤ 0.25D ₁	<4	0.15	<4	0.15	<4	0.10
			4-7	0.10	4-7	0.10	4-7	0.07
		0.25-0.5D ₁	<3	0.05	<3	0.05	<3	0.05
			4-7	0.10	4-7	0.10	4-7	0.10
Heat-resistant Alloy	—	0.5-0.75D ₁	<2	0.10	<2	0.05	<2	0.05
			D ₁ (Slot)	<1	0.05	<1	0.05	<1
H Hardened Steel	40-55HRC	≤ 0.25D ₁	<4	0.10	<5	0.15	<5	0.15
			4-7	0.07	5-7	0.10	5-7	0.10
			7-8.5	0.07	7-8.5	0.07	7-8.5	0.07
			4-7	0.07	4-7	0.07	4-7	0.07
		0.25-0.5D ₁	<2	0.10	<3	0.15	<3	0.15
			2-5	0.07	3-5.5	0.10	3-5.5	0.10
			2-5	0.07	3-5.5	0.10	3-5.5	0.10
			2-5	0.07	3-5.5	0.10	3-5.5	0.10
0.5-0.75D ₁	<4	0.07	<4	0.07	<3	0.07		
	D ₁ (Slot)	<3	0.07	<4	0.07	<3	0.07	

CUTTING SPEED

Work Material	Hardness	Insert			Cutting Width ae (mm)			
		Grade		Breaker	≤0.25D ₁	0.25-0.5D ₁	0.5-0.75D ₁	D ₁ (Slot)
		1st Recommendation	2nd Recommendation					
Cutting Speed vc (m/min)								
P Mild Steel	<180HB	MP6120	VP15TF	M H	230(180-270)	220(170-260)	180(140-210)	180(140-210)
		MP6130	VP20RT	M H	200(150-240)	190(140-230)	150(110-180)	150(110-180)
Carbon Steel Alloy Steel	180-350HB	MP6120	VP15TF	M H	180(140-210)	170(130-200)	140(110-160)	140(110-160)
		MP6130	VP20RT	M H	150(110-180)	140(100-170)	110(80-130)	110(80-130)
M Stainless Steel	<270HB	MP7130	VP15TF	M H	180(140-210)	170(130-200)	140(110-160)	140(110-160)
K Gray Cast Iron	<350MPa	MC5020		H	250(200-300)	240(190-290)	210(160-260)	140(110-160)
		MC5020		H	130(100-150)	120(90-140)	100(80-120)	100(80-120)
N Aluminium Alloy	—	TF15		GM	500(200-1000)	500(200-1000)	500(200-1000)	500(200-1000)
S Titanium Alloy	<350HB	MP9120	VP15TF	M H	50(40-70)			50(40-70)
		MP9130	VP20RT	M H	40(30-60)			40(30-60)
Heat-resistant Alloy	—	MP9120	VP15TF	M H	40(30-60)			40(30-60)
		MP9130	VP20RT	M H	30(20-40)			30(20-40)
H Hardened Steel	40-55HRC	VP15TF		H	90(70-100)	85(60-100)	70(50-80)	70(50-80)

(Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.

Please make adjustments according to the machining conditions.

(Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.

- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
- When the application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.

(Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

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RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT / FEED PER TOOTH

Work Material	Hardness	Cutting Width ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)		
				Cutter Diameter (mm)		
				ø25-ø40	ø50-ø80	ø100-ø160
P Mild Steel Carbon Steel Alloy Steel	≤180HB 180-350HB	≤0.5D1	<5	0.30	0.30	0.25
			5 - 7.5	0.25	0.25	0.20
			7.5 - 10	0.20	0.20	0.15
			10 - 12.5	0.15	0.15	0.10
			12.5 - 15	0.10	0.10	0.07
		0.5-0.75D1	<5	0.20	0.20	0.15
			5 - 10	0.15	0.15	0.10
			10 - 15	0.10	0.10	0.07
		D1 (Slot)	<5	0.15	0.15	0.15
			5 - 7.5	0.10	0.10	0.10
			7.5 - 10	0.07	0.07	0.07
		M Stainless Steel	≤270HB	≤0.5D1	<5	0.30
5 - 7.5	0.25				0.20	0.20
7.5 - 10	0.20				0.15	0.15
10 - 12.5	0.15				0.10	0.10
12.5 - 15	0.10				0.07	0.07
0.5-0.75D1	<5			0.20	0.15	0.15
	5 - 10			0.15	0.10	0.10
	10 - 15			0.10	0.07	0.07
D1 (Slot)	<5			0.15	0.15	0.15
	5 - 7.5			0.10	0.10	0.10
	7.5 - 10			0.07	0.07	0.07
K Gray Cast Iron	Tensile Strength ≤350MPa			≤0.5D1	<5	0.30
		5 - 7.5	0.25		0.25	0.20
		7.5 - 10	0.20		0.20	0.15
		10 - 12.5	0.15		0.15	0.10
		12.5 - 15	0.10		0.10	0.07
		0.5-0.75D1	<5	0.20	0.20	0.15
			5 - 10	0.15	0.15	0.10
			10 - 15	0.10	0.10	0.07
		D1 (Slot)	<5	0.15	0.15	0.15
			5 - 7.5	0.10	0.10	0.10
			7.5 - 10	0.07	0.07	0.07
		Ductile, Cast Iron	Tensile Strength ≤800MPa	≤0.5D1	<5	0.25
5 - 7.5	0.20				0.20	0.20
7.5 - 10	0.15				0.15	0.15
10 - 12.5	0.10				0.10	0.10
12.5 - 15	0.07				0.07	0.07
0.5-0.75D1	<5			0.20	0.20	0.15
	5 - 10			0.15	0.15	0.10
	10 - 15			0.10	0.10	0.07
D1 (Slot)	<5			0.15	0.15	0.15
	5 - 7.5			0.10	0.10	0.10
	7.5 - 10			0.07	0.07	0.07

	Work Material	Hardness	Cutting Width ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)		
					Cutter Diameter (mm)		
					ø25-ø40	ø50-ø80	ø100-ø160
S	Titanium Alloy	≤350HB	≤0.25D ₁	<5	0.15	0.10	0.10
				5-7.5	0.10	0.05	0.05
				7.5-10	0.05	—	—
	Heat-resistant Alloy	—	≤0.25D ₁	<5	0.05	0.05	0.05
				D ₁ (Slot)	<2	0.10	0.05
H	Hardened Steel	40-55HRC	≤0.25D ₁	<5	0.15	0.15	0.15
				5-7.5	0.10	0.10	0.10
				7.5-10	0.07	0.07	0.07
			0.25-0.5D ₁	<5	0.10	0.10	0.10
				5-7.5	0.07	0.07	0.07
				<5	0.07	0.07	0.07
			D ₁ (Slot)	<5	0.07	0.07	0.07

CUTTING SPEED

	Work Material	Hardness	Insert			Cutting Width ae (mm)			
			Grade		Breaker	≤0.25D ₁	0.25-0.5D ₁	0.5-0.75D ₁	D ₁ (Slot)
			1st Recommendation	2nd Recommendation					
Cutting Speed vc (m/min)									
P	Mild Steel	<180HB	MP6120	VP15TF	M H	230(180-270)	220(170-260)	180(140-210)	180(140-210)
			MP6130	VP20RT	M H	200(150-240)	190(140-230)	150(110-180)	150(110-180)
M	Carbon Steel Alloy Steel	180-350HB	MP6120	VP15TF	M H	180(140-210)	170(130-200)	140(110-160)	140(110-160)
			MP6130	VP20RT	M H	150(110-180)	140(100-170)	110(80-130)	110(80-130)
M	Stainless Steel	<270HB	MP7130	VP15TF	M H	180(140-210)	170(130-200)	140(110-160)	140(110-160)
K	Gray Cast Iron	<350MPa	MC5020		H	250(200-300)	240(190-290)	210(160-260)	140(110-160)
	Ductile, Cast Iron	<800MPa	MC5020		H	130(100-150)	120(90-140)	100(80-120)	100(80-120)
S	Titanium Alloy	<350HB	MP9120	VP15TF	H M	50(40-70)			50(40-70)
			MP9130	VP20RT	H M	40(30-60)			40(30-60)
	Heat-resistant Alloy	—	MP9120	VP15TF	H M	40(30-60)			40(30-60)
			MP9130	VP20RT	H M	30(20-40)			30(20-40)
H	Hardened Steel	40-55HRC	VP15TF		H	90(70-100)	85(60-100)	70(50-80)	70(50-80)

(Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.

Please make adjustments according to the machining conditions.

(Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.

- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
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(Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.

(Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

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RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

Work Material	Hardness	Insert				Cutting Width a_e (mm)		
		Grade		Breaker		$\leq 0.15D_1$	0.15–0.3D1	D1 (Slot)
		1st Recommendation	2nd Recommendation					
Cutting Speed v_c (m/min)								
P Mild Steel	$\leq 180\text{HB}$	MP6120	VP15TF	M	H	200(160–250)	160(120–200)	140(120–160)
		MP6130	VP20RT	M	H	170(130–220)	130(90–170)	110(90–130)
	180–350HB	MP6120	VP15TF	M	H	160(120–200)	120(100–140)	100(80–120)
		MP6130	VP20RT	M	H	130(90–170)	90(70–110)	70(50–90)
M Stainless Steel	$\leq 270\text{HB}$	MP7130	VP15TF	M	H	160(120–200)	120(100–140)	100(80–120)
K Gray Cast Iron	$\leq 350\text{MPa}$	MC5020		H		230(180–280)	190(140–240)	190(140–240)
	Ductile, Cast Iron	$\leq 800\text{MPa}$	MC5020		H	190(140–220)	170(120–220)	170(120–220)
S Titanium Alloy	$\leq 350\text{HB}$	MP9120	VP15TF	H	M	50(40–70)		50(40–70)
		MP9130	VP20RT	H	M	40(30–60)		40(30–60)
	Heat-resistant Alloy	MP9120	VP15TF	H	M	40(30–60)		40(30–60)
		MP9130	VP20RT	H	M	30(20–40)		30(20–40)

DEPTH OF CUT / FEED PER TOOTH

Work Material	Hardness	Cutting Width a_e (mm)	Depth of Cut a_p (mm)	Feed per Tooth f_z (mm/tooth)			
				Cutter Diameter (mm)			
				$\phi 40$ Length of cut 56mm $\phi 50$ Length of cut 42mm	$\phi 50$ Length of cut 56mm $\phi 63$ Length of cut 56mm	$\phi 50$ Length of cut 84mm	
P Mild Steel	$\leq 180\text{HB}$	$\leq 0.3D_1$	<20	0.25	0.25	0.20	
			20–50	0.20	0.20	0.15	
			50–80			0.10	
		D1 (Slot)	<20	0.20	0.20	0.15	
	180–350HB	$\leq 0.3D_1$	<20	0.25	0.25	0.20	
			20–50	0.20	0.20	0.15	
			50–80			0.10	
		D1 (Slot)	<20	0.15	0.15	0.10	
20–50			0.10	0.10			
M Stainless Steel	$\leq 270\text{HB}$	$\leq 0.3D_1$	<20	0.25	0.25	0.20	
			20–50	0.20	0.20	0.15	
			50–80			0.10	
		D1 (Slot)	<10	0.10	0.10	0.07	
K Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	$\leq 0.15D_1$	<10	0.30	0.30	0.25	
			10–50	0.25	0.25	0.20	
			50–80			0.15	
		0.15–0.3D1	<10	0.25	0.25	0.20	
			10–50	0.20	0.20	0.15	
			50–80			0.10	
	D1 (Slot)	<10	0.25	0.25	0.20		
		10–50	0.20	0.20	0.15		
	S Ductile, Cast Iron	Tensile Strength $\leq 800\text{MPa}$	$\leq 0.15D_1$	<20	0.25	0.25	0.20
				20–50	0.20	0.20	0.15
				50–80			0.10
0.15–0.3D1			<20	0.20	0.20	0.15	
			20–50	0.15	0.15	0.10	
			50–80			0.07	
D1 (Slot)		<10	0.15	0.15	0.10		
		10–50	0.10	0.10			
S Titanium Alloy		$\leq 350\text{HB}$	$\leq 0.15D_1$	<20	0.10	0.10	
				20–50	0.10	0.10	
			D1 (Slot)	<50	0.08	0.08	
Heat-resistant Alloy	–	$\leq 0.15D_1$	<10	0.07	0.07		
		D1 (Slot)	<20	0.05	0.05		

(Note) The above cutting conditions are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

Memo

A series of horizontal dashed lines for writing, spanning the width of the page.

Products equipped with **MP6100/MP7100/MP9100**

Product cross reference chart

Product Chip Breaker Grade	APX 3000/4000		A5X400				A5X445			AJX		
	M	H	JL	JM	JH	FT	JL	JM	JH	FT	ST	JM
MP6120	●	●	●	●	●	●	●	●	●	●	●	●
MP6130	●	●	●	●	●		●	●	●	●	●	●
MP7130	●	●		●	●		●	●	●	●	●	●
MP7140			●	●	●		●	●	●	●	●	●
MP9120	●	●	●		●	●	●		●			
MP9130	●	●		●	●	●	●	●	●			

A5X400

MP6100/MP7100/MP9100
JM | JL | JH | FT



A5X445

MP6100/MP7100/MP9100
JM | JL | JH



AJX

MP6100/MP7100
JM | FT | ST



APX3000/4000

MP6100/MP7100/MP9100
M | H



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